

Hippodamia variegata, Goeze.—Description of some further new aberrations, and observations on ab. 3-punctata, Haw., and ab. 9-punctata, Haw.

By G. B. C. LEMAN, F.E.S.

1. ab. *externepunctata*, n.ab.

This aberration has the common scutellar spot and one isolate spot No. 2.

Weise in his B.T. (1879) gives as formula of his ab. *inhonesta* 5, $\frac{1}{2}$, but subsequently, in 1885, he appears not only to give it the new formula of 2, $\frac{1}{2}$, but to group it with 3- and 5-spotted aberrations under the omnibus name of var. *5-maculata*, Fabr., where obviously neither can remain.

I was unable to obtain or trace any copy of Weise's B.T. (1885), and for the following extract I am indebted to Professor Kölbe of the Zool. Mus., Berlin:—

“(b) Fld. mit 3 bis 5 Punkten: aa. 3 P., Z.B. 5, $\frac{1}{2}$ oder 4, $\frac{1}{2}$ oder 6, $\frac{1}{2}$ oder 2, $\frac{1}{2}$ (*inhonesta*, Ws.); bb. 5 P., Z.B. 3, 5, $\frac{1}{2}$ oder 4, 5, $\frac{1}{2}$ oder 2, 3, $\frac{1}{2}$ oder 1, 5, $\frac{1}{2}$ oder 5, 6, $\frac{1}{2}$ oder 4, 6, $\frac{1}{2}$ oder 4 + 5, $\frac{1}{2}$ v. *5-maculata*, Fabr.”

Of the above 3-spotted aberrations 5, $\frac{1}{2}$ = ab. 3-punctata, Haw. (Syn: ab. *inhonesta*, Ws.); 4, $\frac{1}{2}$ = ab. *hummeli*, Ws. (1879); 6, $\frac{1}{2}$ = ab. *sesquipunctata*, mihi; 2, $\frac{1}{2}$ = ab. *externepunctata*, mihi; and of the 5-spotted series, 3, 5, $\frac{1}{2}$ = ab. *artemisiae*, Ws. (1879); 4, 5, $\frac{1}{2}$ = ab. *5-maculata*, Fabr.; 2, 3, $\frac{1}{2}$ = ab. *binisesquipunctata*, mihi; 1, 5, $\frac{1}{2}$ = ab. *obliquepunctata*, mihi; 5, 6, $\frac{1}{2}$ = ab. *5-punctata*, Walt. (1882); 4, 6, $\frac{1}{2}$ = ab. *lugubris*, Walt. (1882); and 4 + 5, $\frac{1}{2}$ = ab. *commaculata*, mihi.

In the circumstances I propose to give the aberration with formula 2, $\frac{1}{2}$ the name of ab. *externepunctata* and Weise's ab. *inhonesta* (1879), with formula 5, $\frac{1}{2}$ sinks as a synonym of ab. 3-punctata, Haw.

FORMULA: 2, $\frac{1}{2}$.

2. ab. 3-punctata, Haworth, *Trans. Ent. Soc. Lond.*, i., 276.10.E. (1812).

“10. *C. 7-notata* (v) 3-punctata: Coleoptris rubris, punctis nigris tribus, uno communi, altero in singulo elytro, pone medium suturam versus, caetera fere ut in ultimâ varietate (i.e. δ *5-maculata*, Fabr.) Long. Corp. 2 lin. *Coccinella 3-punctata*, Linn., Syst. Oper. et ejus Musaei. Communicavit S. Wilkins. Variat. duplo major.”

The reference to Linnæus is obviously wrong, as the latter's specimen = *C. 11-punctata*, L. ab. 3-punctata, L., while *C. 7-notata*, Haw., = *H. variegata*, Goez., ab. *constellata*, Laich., and his var. β (*9-notata*) is in fact the type.

Weise appears to have been unaware of Haworth's paper on *Coccinella*, and the latter's ab. 3-punctata has priority over Weise's ab. *inhonesta* (1879).

FORMULA: 5, $\frac{1}{2}$.

3. ab. *sesquipunctata*, n.ab.

This aberration as mentioned above is wrongly grouped by Weise (1885) under ab. *5-maculata*, Fabr.

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There appears to be a typographical error in Mulsant's description of this aberration in *Séc.* (1846) under var. C. γ of "cinquième" for "sixième" as his var. C. β has already dealt with the "cinquième" spot. I need perhaps hardly remark that Mulsant reckons his spots from suture to margin instead of from margin to suture.

FORMULA: 6, $\frac{1}{2}$.

4. ab. *obliquipunctata*, n.ab.

This aberration is again wrongly grouped by Weise (1885) under ab. 5-*maculata*, Fabr.

FORMULA: 1, 5, $\frac{1}{2}$.

5. ab. *biuisesquipunctata*, n.ab.

The last observation applies also to this aberration.

FORMULA: 2, 3, $\frac{1}{2}$.

6. ab. *commaculata*, n.ab.

The same observation equally applies to this aberration, which differs from ab. 5-*maculata*, Fabr., in the confluence of spots 4 and 5.

FORMULA: 4 + 5, $\frac{1}{2}$.

7. ab. *latreillei*, n.ab.

Latreille in his *Hist. Nat. Crust. et Ins.* t. 12. 57. 15. f. et g. (1802), under *C. mutabilis* describes this aberration as follows:—

"f. Corselet de même; élytres à neuf points, un à la base, le deux répondant aux deux de la seconde ligne des variétés qui en ont treize, manquant.

"g. Elytres de la précédente: corselet de la var. C."

The reference to the corselet (Thorax) in (f.) is:

"Bord jaune et extérieur du corselet jetant dans son milieu et postérieurement un petit rameau ou dent jaune."

and that of (g):

"Bordure jaune et antérieure du corselet trifide."

It will be noted that Latreille attempts to make two aberrations of a specimen with the same elytral formula of spots based on minor variations of the thorax. Other authors in this species have done the same, but fortunately for the most part, as in Latreille's case, without assigning to such thoracic variations any specific name. I do not consider these minor variations of the thoracic markings justify separation for purposes of nomenclature, and I propose to bracket Latreille's vars. (f) and (g) under the above name with

FORMULA: 1, 2, 3, 6, $\frac{1}{2}$.

(8) ab. *bearei*, n.ab.

This aberration with 9 spots has the three posterior spots 4, 5 and 6 confluent. The isolate spot is No. 1 and the common scutellar spot is present.

Costa in his *Faun. Reg. Nap.* fasc. 65. 15. 1 (f) (1849), under *A. mutabilis* describes without name an aberration which appears to have some affinity to my aberration:—

"(f) elitre comme nella varietà precedente—(i.e. (e) = type form)—coi tre punti posteriori dilatati e legato insieme, ora il solo quarto col quinto, ora anelie il quinto col sexto."

Such affinity extends, of course, only to the "tre punti posteriori dilatati e legato insieme," and while he states that spots 4, 5 and 6 are dilated and confluent, he does not define clearly whether such confluence is so dilated as in fact to form the irregular black blotch which is found in ab. *turkmenica*, Zoubk. (1833), ab. *zoubkoffii*, Leman (1922) and ab. *maculigera*, (Weise) Leman (1922), but is not found in this aberration. I have the honour with his permission to name this aberration after Professor T. Hudson Beare, B. Sc., F.R.S.E., F.E.S. Type in his collection, taken at Southport on 13 June, 1903.

FORMULA: 1, 4 + 5 + 6, $\frac{1}{2}$.

9. ab. *costae*, n.ab.

Included in Costa's var. (f) is in fact another unnamed aberration in which spots 5 and 6 are confluent—"ora anelie il quinto col sexto."

The aberration with spots 4 and 5 confluent—"ora il solo quarto col quinto"—included in Costa's var. (f) = ab. *angulosa*, Ws. (1879).

FORMULA: 1, 4, 5 + 6, $\frac{1}{2}$.

10. ab. *weisei*, n.ab.

This aberration with formula 2, 4 + 5, 6, $\frac{1}{2}$ is grouped by Weise (1885) in another omnibus group of 9-spotted aberrations under v. *carpini*, Fourcr. (= *H. variegata*, Goez., type form), where it cannot remain and I cannot do better than append a further extract of this group:—

"e. Fld. mit 9 P. aa. 1, 4, 5, 6, $\frac{1}{2}$ (*9-punctata*, Schrank; *carpini*, Fourcr.); bb. 1, 4 + 5, 6, $\frac{1}{2}$; cc. 1, 2, 3, 5, $\frac{1}{2}$; dd. 1, 3, 4, 5, $\frac{1}{2}$; ee. 2, 4, 5, 6, $\frac{1}{2}$; ff. 2, 4 + 5, 6, $\frac{1}{2}$; gg. 2, 3, 4, 5, $\frac{1}{2}$ (*arenaria*, Sajo); hh. 3, 4, 5, 6, $\frac{1}{2}$ (*biconstellata*, Sajo) . . . v. *carpini*, Fourcroy."

As regards this group:—aa. = type form; bb. = ab. *angulosa*, Ws. (1879); cc. = ab. *simplex*, Ws. (1879); dd. = ab. *campestris*, Ws. (1879); ee. = ab. *basilaris*, Ws. (1879); ff. = ab. *weisei*, mihi; gg. = ab. *arenaria*, Sajo (1881) and hh. = ab. *9-punctata*, Haw. (1812) and has priority over ab. *biconstellata*, Sajo (1881).

This aberration differs from ab. *basilaris*, Ws. (1879) f. nn. and (1885) e.ee. in the confluence of spots 4 and 5.

FORMULA: 2, 4 + 5, 6, $\frac{1}{2}$.

11. ab. *thompsoni*, n.ab.

This aberration has in addition to the isolate spots 2, 5, and $\frac{1}{2}$, the unique confluence of spots 4 and 6.

Type in the general collection at the Nat. Hist. Museum, S. Kensington (1904, 229).

Taken by Mr. F. M. Thompson (July, 1902) at Tientsin.

FORMULA: 2, 4 + 6, 5, $\frac{1}{2}$.

12. ab. *9-punctata*, Haworth. *Trans. Ent. Soc. Lond.* I. 275/6, 10. Y. (1812).

"10. *C. 7-notata* γ . *9-punctata*. Coleoptris punctis parvis novem. viz. uno communi, caeteris duplo majore, altero minuto ante medium, singulo elytro, suturam versus, tribusque posticis triangulatim positus parvis. Caput flavum vertice nigro, thorax margine

antico lateribusque albidis disco triradiatim albido. Communicavit ejus captor. Rev. J. Burrell. Varietas rarissima."

Sajo in describing his ab. *biconstellata* in *Ent. Nachr.* 273. 3. (1881) as under:—

"3. var. *biconstellata*, mihi—Flügdd. mit 9 Punkten: 3, 4, 5, 6, $\frac{1}{2}$.

appears to have been unaware of Haworth's earlier name for this aberration and consequently ab. *biconstellata*, Sajo sinks as a synonym.

Taken by Mr. H. St. J. K. Donisthorpe (1920) at Barton Mills.

FORMULA: 3, 4, 5, 6, $\frac{1}{2}$.

13. ab. *julii*, n.ab.

This aberration, which differ only from ab. *relax*, Ws. (1879) in the confluence of spots 4 and 5, is first mentioned by Weise (1885) in his omnibus group of ab. *neglecta*, Ws. (1879) and for reference I append an extract of this group:—

"f. Fld. mit 11 P. aa. 1, 3, 4, 5, 6, $\frac{1}{2}$ (*neglecta*, Ws.); bb. 1, 3, 4 + 5, 6, $\frac{1}{2}$; cc. 1, 2, 4, 5, 6, $\frac{1}{2}$; dd. 1, 2, 4 + 5, 6, $\frac{1}{2}$; ee. 2, 3, 4, 5, 6, $\frac{1}{2}$; ff. 2, 3, 4 + 5, 6, $\frac{1}{2}$
v. *neglecta*, Weise."

Of this group:—aa. = ab. *neglecta*, Ws. (1879); bb. = ab. *abbreviata*, Ws. (1879); cc. = ab. *relax*, Ws. (1879); dd. = ab. *julii*, mihi; ee. = ab. *undecimpunctata*, Schrank (1781) and ff. = ab. *evertsi*, mihi (1922).

FORMULA: 1, 2, 4 + 5, 6, $\frac{1}{2}$.

14. ab. *evertsi*, n.ab.

This is the aberration ff. of Weise's (1885) group of f. wrongly grouped under ab. *neglecta*, Ws., where it cannot be left.

It is in fact in the spots 4 and 5 a confluent form of ab. *undecimpunctata*, Schrank.

FORMULA: 2, 3, 4 + 5, 6, $\frac{1}{2}$.

15. ab. *lunetta*, n.ab.

This aberration with thirteen spots has two confluences, *viz.*, 3 + $\frac{1}{2}$, and 5 + 4 + 6, the latter confluence being so far as I know quite unique, and the inverse of ab. *bearei*, mihi.

In form this latter confluence resembles the "merry-thought" of a fowl, and I have therefore ventured to give it the name of "*lunetta*," after "lunette," the French for "merry-thought."

Taken at Tientsin by Mr. F. M. Thompson, in July, 1902.

Type in General Collection of the Nat. Hist. Museum, S. Kensington (1904, 229).

FORMULA: 1, 2, 3 + $\frac{1}{2}$, 5 + 4 + 6.

16. ab. *comma*, n.ab.

This aberration has also thirteen spots, with Nos. 1 and 3 confluent in the shape of a comma, hence its name. Spots 4, 5 and 6 are uniformly large.

Taken at Njoro, B.E.A., by Mr. T. J. Anderson.

Type in General Collection of the Nat. Hist. Museum, S. Kensington (1911, 384).

FORMULA: 1 + 3, 2, 4, 5, 6, $\frac{1}{2}$.

17. ab. *andersoni*, n.ab.

This is a very remarkable aberration by reason of the extensive confluence of spots 3 + 1 + 2 + 4 + 5, the only isolate spot being No. 6, which is large. The scutellar spot is present.

Also taken at Njoro, B.E.A., by Mr. T. J. Anderson.

Type in General Collection of the Nat. Hist. Museum, S. Kensington (1911, 384).

FORMULA: 3 + 1 + 2 + 4 + 5, 6, $\frac{1}{2}$.

18. ab. *blairi*, n.ab.

This aberration with thirteen spots is a very striking one, in view as well of the two bold confluences of spots 2 + 1 + 3 and 4 + 5, as of its entirely black thorax. In this latter respect it is, so far as I can trace, unique, and the antithesis of ab. *albicollis*, Chobaut, with its white thorax.

In this aberration the only isolate spots are Nos. 6 and $\frac{1}{2}$.

I have with his permission named this aberration after Mr. K. G. Blair, B.Sc., F.E.S., of the Natural History Museum, S. Kensington, as a slight acknowledgment of his invaluable help, while I have been working at the Museum on this species.

Taken at Njoro, B.E.A., by Mr. T. J. Anderson.

Type in General Collection of the Nat. Hist. Museum, S. Kensington (1911, 384).

FORMULA: 2 + 1 + 3, 4 + 5, 6, $\frac{1}{2}$.

Somatic Mosaics in Lepidoptera.

By E. A. COCKAYNE, M.D., F.E.S.

In August, 1917, Mr. H. B. Williams obtained a pupa of *Vanessa io*, L., at Hohnwood, the two sides of which were different in colour. He has kindly given me the pupa-case, the imago, which emerged from it, and a photograph he took before emergence. The division between the two colours is quite sharp and runs exactly along the middle line. The pupal skin of the right side is darker in colour and covered with a fine dark reticular pattern, that of the left side is pale and only shows faint indications of the reticular pattern; the dorsal spines of the right side are deeply pigmented down to their bases, those of the left are only pigmented at the tip. The imago which emerged appeared to be a female, and the wings showed no difference in colour or pattern on the two sides. Its only abnormality was a slight crumpling of the posterior border. The palpi and antennæ were of equal length.

Dissection of the dried abdomen was fairly successful. Both ovaries were identified, as were the cement glands, the ductus bursæ and the bursa copulatrix. The spermatheca were broken. The external genitalia were normal and female. There was no contrast in the surroundings, in which the larva pupated, nor do I know of any evidence that in a larva susceptible to its surroundings during pupation a dark background on one side and a light one on the other will produce a difference in colour on the two sides of the pupa.

I think it belongs to the group which I described in the *Journal of Genetics*, 1915, v., p. 87, under the name "Heterochroism." Had the species been a more variable one the imago also might have shown a difference in colour on the two sides.